



DETAILED DESCRIPTION

03 A method and apparatus for providing a secure software rental system is described. In the following description, numerous specific details, such as number and nature of messages, communication applications, etc., are described in detail in order to provide a more thorough description of the present invention. It will be apparent, however, to one skilled in the art, that the present invention may be practiced without these specific details. In other instances, well-known features have not been described in detail so as not to unnecessarily obscure the present invention.

A. Embodiment of Computer Execution Environment (Hardware) for a user computer.

Figure 1 is a diagram illustrating a remote user computer system (herein also referred to as client system) 150 connected to a central rental facility (herein also referred to as server system) 180 by electronic communications path 136A for securely renting software. The remote user computer system 150 includes user computer 102, a display device 104, a keyboard 18, and a communication modem 106. The central rental facility 180 includes database computer 122, a display device 124, a keyboard 128, and a multi-user communication modem 126. Coupling 112 connects user computer 102 to display 104 for providing output to a user. Coupling 114 connects keyboard 108 to user computer 102 for providing input from a user. Modem 106 is connected to user computer 102 by coupling 110.

Modem 106 of remote user computer system 150 is coupled to multi-user communication modem 126 by communication path 136A. In one embodiment of the present invention, communication path 136A is a telephone transmission line. In another embodiment, communication path 136A includes a means of communication through available Internet service providers or Systems. Thus, the present invention is not limited to a telephone transmission line, and other communication paths may be utilized without departing from the scope of the present invention. Multi-user modem 126 is coupled to a plurality of communication paths 136A-136C for establishing communications with a plurality of remote user computer systems concurrently. Multi-user modem 126 is connected to database computer 122 by coupling 120. Coupling 132 connects database computer 122 to display 124 for providing output to an operator. Coupling 134 connects keyboard 128 to database computer 122 for providing input from an operator while a single keyboard 128 and display device 124 are illustrated in Figure 1, it should be apparent to a person skilled in the art that the present invention may be practiced with a plurality of such devices coupled to the database computer.

The user computer 102 of the remote user computer system 150 comprises a processing means coupled to main memory (e.g., random access memory RAM and/or read only memory ROM), secondary storage means (e.g., media storage systems and/or CDROM), and input/output ports for communicating with other devices including keyboards, printers, displays,

As illustrated in Figures 1, 20, 21, and 22, client system 150 includes a video memory 10014, main memory 10015 and mass storage 10012, all coupled to bi-directional system bus 10018 along with keyboard 108, mouse 107 and CPU 2102. The mass storage 10012 may include both fixed and removable media, such as magnetic, optical or magnetic optical storage systems or any other available mass storage technology. Bus 10018 may contain, for example, thirty-two address lines for addressing video memory 10014 or main memory 10015. The system bus 10018 also includes, for example, a 32-bit data bus for transferring data between and among the components, such as CPU 2102, main memory 10015, video memory 10014 and mass storage 10012. Alternatively, multiplex data/address lines may be used instead of separate data and address lines.

Figure 22 illustrates one embodiment of the invention, where the CPU 102 is a microprocessor manufactured by Motorola, such as the 680X0 processor or a microprocessor manufactured by Intel, such as the 80X86, or Pentium processor, or a SPARC microprocessor from Sun Microsystems. However, any other suitable microprocessor or microcomputer may be utilized. Main memory 15015 is comprised of dynamic random access memory (DRAM). Video memory 10014 is a dual-ported video random access memory. One port of the video memory 10014 is coupled to video amplifier 10016. The video amplifier 10016 is used to drive the cathode ray tube (CRT) raster monitor 104. Video amplifier 10016 is well known in the art and may be implemented by any suitable apparatus. This circuitry converts

pixel data stored in video memory 15014 to a raster signal suitable for use by monitor 104. Monitor 104 is a type of monitor suitable for displaying graphic images.

Computer system 150, as illustrated by figure 22, in one embodiment includes a communication interface 10020 coupled to bus 10018. Communication interface 10020 provides a two-way data communication coupling via a network link 10021 to a local network 10022. For example, if communication interface 10020 is an integrated services digital network (ISDN) card or a modem, communication interface 10020 provides a data communication connection to the corresponding type of telephone line, which comprises part of network link 136A. If communication interface 10020 is a local area network (LAN) card, communication interface 10020 provides a data communication connection via network link 136A to a compatible LAN. Wireless links are also possible. In any such implementation, communication interface 10020 sends and receives electrical, electromagnetic or optical signals which carry digital data streams representing various types of information.

According to an embodiment of the current invention, as illustrated in figure 22, network link 10021 provides data communication through one or more networks to other data devices. For example, network link 10021 may provide a connection through local network 10022 to host computer 10023 or to data equipment operated by an Internet Service Provider (ISP) 10024. ISP 10024 in turn provides data communication services through the world wide

packet data communication network now commonly referred to as the "Internet" 136A. Local network 10022 and Internet 136A both use electrical, electromagnetic or optical signals which carry digital data streams. The signals through the various networks and the signals on network link 10021 and through communication interface 10020, which carry the digital data to and from computer system 150, are exemplary forms of carrier waves transporting the information.

In another embodiment, computer system 150 sends messages and receives data, including program code, through the network(s), network link 10021, and communication interface 120. In the Internet example, server 180 might transmit a requested code for an application program through Internet 136A, ISP 10024, local network 10022 and communication interface 120. In accord with one embodiment of the invention, one such downloaded application is the on-line postage system software described herein.

In one embodiment received code may be executed by CPU 102 as it is received, and/or stored in mass storage 10012, or other non-volatile storage for later execution. In this manner, computer 150 may obtain application code in the form of a carrier wave.

The computer systems described above are for purposes of example only. An embodiment of the invention may be implemented in any type of computer system or programming or processing environment.

computer 102 into the memory of the user computer 102. In step 608, the rental application is executed. In step 610, the normal flow of the rental application is performed. Execution continues at step 616. In step 612, in parallel with the normal flow process of step 610, the asynchronous header password verification process is performed without transferring the rental application. In step 614, a message for an unsuccessful connection is sent to the rental application. Execution continues at step 616. In step 616, the rental application is terminated. In step 618, the rental session is terminated.

CS Figures 7A-7B are flow diagrams illustrating step 612 of Figure 6 for performing the asynchronous header password verification process after connecting to the database computer 122 without, however, transferring the rental application from the database computer 122. In step 702, the password verification process is started. In step 704, communication is established between the user and database computers using the communication manager of the present invention. In decision 706, a check is made to determine if communication is established using the communication manager. When decision block 706 returns false (no), execution continues at step 720. When decision block 706 returns true (yes), execution continues at step 708.

In step 708, a rental application transfer time request is created using the user identifier and the application identifier. In step 710, the rental application transfer time request is encrypted. In step 712, the rental application transfer time request is sent to the multi-user controller 222 through the communication manager. In decision block 714, a check is made